WHAT IS CLAIMED IS:

1. A method of modulating light in an optical communication system comprising:

transmitting light through a gel membrane positioned adjacent to a surface of a transparent prism, wherein a plurality of individually addressable electrodes are positioned on a substrate opposite the prism and spaced apart from a surface of the gel membrane such that a gap exists between the electrodes and the surface of the gel membrane;

applying an excitation voltage to each electrode, thereby generating a wave pattern on a surface of the gel membrane superimposed on an initial state of the gel membrane; and

regulating the excitation voltages applied to the electrodes such that the gel membrane returns to the initial state in response to removal of the excitation voltages.

2. The method of Claim 1, further comprising providing light to or receiving light from the optical communication system through an optical fiber attached to the prism.

3. The method of Claim 1, wherein the prism is positioned over the substrate such that a direction of the prism top is perpendicular to a direction of the electrodes on the substrate.

4. The method of Claim 1, wherein the prism is positioned over the substrate such that a direction of the prism top is parallel to a direction of the electrodes on the substrate.

5. A device for modulating light in an optical communication system, comprising:

a prism transmitting light to/from the optical communication system;

a gel membrane positioned adjacent to a surface of the prism;

a substrate having a plurality of individually addressable electrodes located at a distance from a surface of the gel membrane opposite the prism surface, wherein a gap exists between the electrodes and the surface of the gel membrane;

an excitation voltage source configured to provide regulated excitation voltage to each of the plurality of electrodes, and configured to generate a wave pattern on a

surface of the gel membrane superimposed on an initial state of the gel membrane, wherein the excitation voltage source comprises a compensating device configured to cause the gel membrane to return to the initial state upon removal of the excitation voltages.

6. The device of Claim 5, further comprising at least one optical fiber attached to the prism and configured to provide light to/from the optical communication system.

7. The device of Claim 5, wherein the prism is positioned over the substrate such that a direction of the prism top is perpendicular to the electrodes on the substrate.

8. The device of Claim 5, wherein the prism is positioned over the substrate such that the direction of the prism top is parallel to the electrodes on the substrate.

9. The device of Claim 5, wherein the excitation voltage source is further configured to provide different voltages to each of the plurality of electrodes.

10. The device of Claim 5, wherein the excitation voltage source is further configured to provide individual voltages to each of the plurality of electrodes.

11. The device of Claim 5, wherein the electrodes are arranged in at least three adjacent parallel rows comprising equal numbers of addressable electrodes, thereby configured to generate at least three wave patterns at the same time on the surface of the gel membrane, and thereby providing a means of optically summing reflected or attenuated light from at least the three wave patterns on the gel membrane.

12. The device of Claim 5, wherein every other electrode on the substrate is connected to ground while a voltage is applied to the other electrodes, and wherein the arrangement is periodically reversed such that a voltage is applied to the grounded electrodes while the other electrodes are grounded.

13. The device of Claim 5, further comprising a photodiode or a phototransistor configured to measure a level of light output from the prism, and further configured to provide a correction signal to the compensation means.

14. The device of Claim 5, comprising a memory of target voltages for the plurality of electrodes, wherein the memory is in communication with the compensating means.